

Study Guide

9.2 Blue

1
4
9
16
25
36
49
64
81
100
121

Simplifying Square Roots

Since $6 \times 6 = 36$, a **square root** of 36 is 6.

$$\sqrt{36} = 6$$

If the square root of a number is a whole number, the original number is called a **perfect square**. For example, 169 is a perfect square because $13 \times 13 = 169$. However, neither 168 nor 170 are perfect squares.

A **radical expression** is an expression that contains a square root. To simplify a radical expression, make sure that the radicand has no perfect square factors other than 1.

Examples: 1 Simplify $\sqrt{18}$.

$$\begin{aligned}\sqrt{18} &= \sqrt{3 \cdot 3 \cdot 2} \\ &= \sqrt{3 \cdot 3} \cdot \sqrt{2} \\ &= 3 \cdot \sqrt{2} \\ &= 3\sqrt{2}\end{aligned}$$

2 Simplify $\sqrt{4} \cdot \sqrt{8}$.

$$\begin{aligned}\sqrt{4} \cdot \sqrt{8} &= \sqrt{4 \cdot 8} \\ &= \sqrt{2 \cdot 2 \cdot 2 \cdot 2 \cdot 2} \\ &= \sqrt{2 \cdot 2} \cdot \sqrt{2 \cdot 2} \cdot \sqrt{2} \\ &= 2 \cdot 2 \cdot \sqrt{2} \text{ or } 4\sqrt{2}\end{aligned}$$

Simplify each expression.

1. $\sqrt{25}$

2. $\sqrt{64}$

3. $\sqrt{196}$

4. $\sqrt{900}$

5. $\sqrt{324}$

6. $\sqrt{529}$

7. $\sqrt{72}$

8. $\sqrt{24}$

9. $\sqrt{99}$

10. $\sqrt{300}$

11. $\sqrt{90}$

12. $\sqrt{75}$

13. $\sqrt{2} \cdot \sqrt{25}$

14. $\sqrt{3} \cdot \sqrt{32}$

15. $\sqrt{5} \cdot \sqrt{8}$

16. $\frac{\sqrt{4}}{\sqrt{9}}$

17. $\frac{\sqrt{16}}{\sqrt{36}}$

18. $\frac{\sqrt{2401}}{\sqrt{49}}$

Skills Practice*9-2 Blue****Simplifying Square Roots******Simplify each expression.***

1. $\sqrt{9}$

2. $\sqrt{169}$

3. $\sqrt{400}$

4. $\sqrt{225}$

5. $\sqrt{256}$

6. $\sqrt{900}$

7. $\sqrt{289}$

8. $\sqrt{2500}$

9. $\sqrt{44}$.

10. $\sqrt{18}$

11. $\sqrt{75}$

12. $\sqrt{300}$

13. $\sqrt{98}$

14. $\sqrt{90}$

15. $\sqrt{125}$

16. $\sqrt{80}$

17. $\sqrt{250}$

18. $\sqrt{12} \cdot \sqrt{5}$

19. $\sqrt{6} \cdot \sqrt{6}$

20. $\sqrt{10} \cdot \sqrt{2}$

21. What is the square root of 625?

22. Multiply $\sqrt{17} \cdot \sqrt{3}$.23. Write $\sqrt{3} \cdot \sqrt{15}$ in simplest form.

Practice*92 blue**122****Simplifying Square Roots******Simplify each expression.***

1. $\sqrt{169}$

2. $\sqrt{36}$

3. $\sqrt{25}$

4. $\sqrt{300}$

5. $\sqrt{75}$

6. $\sqrt{45}$

7. $\sqrt{3} \cdot \sqrt{6}$

8. $\sqrt{3} \cdot \sqrt{7}$

9. $\sqrt{5} \cdot \sqrt{30}$

10. $\frac{\sqrt{35}}{\sqrt{7}}$

11. $\frac{\sqrt{25}}{\sqrt{64}}$

12. $\sqrt{\frac{64}{16}}$

13. $\frac{\sqrt{5}}{\sqrt{3}}$

14. $\frac{\sqrt{3}}{\sqrt{5}}$

15. $\sqrt{\frac{2}{10}}$